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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,705	02/26/2002	Howie Choset		1527

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EXAMINER

VAN PELT, BRADLEY J

ART UNIT

PAPER NUMBER

3682

DATE MAILED: 04/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/083,705

Applicant(s)

CHOSET ET AL.

Examiner

Bradley J Van Pelt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Peter (USPN 4,703,668).

Peter discloses a robotic joint comprising: a first bay (15); a first cup (30) rotatably connected to the first bay; a second cup (42) rotatably connected to the first cup; a second bay (21) rotatably connected to the second cup; and a gear train connected to the first and the second bay; wherein the relative orientation of the first and second bays is preserved when the first cup rotated relative to the second cup;

wherein the gear train comprises (see fig. 2): a first bevel pinion (33); a first bevel gear (51, half in meshing contact with 33) mating the first bevel pinion; a second bevel gear (51, half in meshing contact with 40) fixedly connected to the first bevel gear; and a second bevel pinion (40) mating the second bevel gear; wherein the first bevel pinion is fixedly connected to the first bay, and the second bevel pinion is fixedly connected to the second bay;

the gear train further comprises a bevel gear bearing (52) having an internal ring (biased against 51), the internal ring being fixedly connected to at least one of the first and second bevel gears;

a) the first bay and the first cup are rotatably connected with a first pair of bearings (31), the first pair of bearings having a first pair of internal rings and a first pair of external rings, the first pair of internal rings being fixedly connected to the first cup and the first pair of external rings being fixedly connected to the first bay, whereby the first pair of bearings allow the first bay to rotate relative to the first cup about a common axis of rotation; and

b) the second bay and the second cup are rotatably connected with a second pair (43) of bearings, the second pair of bearings having a second pair of internal rings and a second pair of external rings, the second pair of internal rings being fixedly connected to the second cup and the second pair of external rings being fixedly connected to the second bay, whereby the second pair of bearings allow the second bay to rotate relative to the second cup about a common axis of rotation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peter, as applied to claim 5, in view of Shum (USPN 4,499,784).

Peter discloses all of the instantly claimed invention except,

- a) a first spur gear fixedly connected to the first cup;
- b) a first spur pinion gear mating the first spur gear;

c) a first motor shaft fixedly connected to the first spur pinion gear and having a common axis of revolution therewith;

d) a first minor bearing having an internal ring and an external ring, the internal ring being fixedly connected to the first motor shaft, the external ring being fixedly connected to the first bay;

e) a second spur gear fixedly connected to the second cup;

f) a second spur pinion gear mating the second spur gear;

g) a second motor shaft fixedly connected to the second spur pinion gear and having a common axis of revolution therewith; and

h) a second minor bearing having an internal ring and an external ring, the internal ring being fixedly connected to the second bay;

whereby a rotation of the first motor shaft induces a rotation of the first cup with respect to the first bay, and a rotation of the second motor shaft induces a rotation of the second cup with respect to the second bay.

Shum shows a spur gear (63) fixedly connected to a cup (4); a spur pinion gear (63) mating the spur gear; a motor shaft (60) fixedly connected to the spur pinion gear and having a common axis of revolution therewith; a minor bearing (shown in fig. 7) having an internal ring and an external ring, the internal ring being fixedly connected to the motor shaft, the external ring being fixedly connected to a bay (11).

To modify the apparatus of Peter so as to drive the first and second cup with spur gear combination would have been obvious to one of ordinary skill in the art in view of the teachings of Shum that such an arrangement improves the ability to run electrical cables and air hoses

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through the arm or wrist of a robot arm, thus improving the functionality of the robot joint (see Shum column 1, lines 26-35).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fortin et al. (USPN 3,315,542), Stackhouse (USPN 4,068,536), Obrietan (USPN 4,841,795), and Bruno (USPN 4,854,808).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley J Van Pelt whose telephone number is (703)305-8176. The examiner can normally be reached on M-Th 7:00-4:30, 2nd F 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David A Bucci can be reached on (703)308-3668. The fax phone numbers for the organization where this application or proceeding is assigned are (703)746-9391 for regular communications and (703)305-3597 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-2168.

BJVP:*BJVP*
April 18, 2003

David A. Bucci 4/21/03
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